

## WHAT IS CLAIMED IS

1 1. A method for achieving uniform expansion of a dielectric plate  
2 comprising the following steps:

3 (a) providing a mold for injection-molding the dielectric plate;

4 (b) determining locations, sizes and shapes of core pins of the  
5 mold;

6 (c) injecting a plasticized dielectric material into the mold to form  
7 the dielectric plate wherein the core pins guide a flow of the  
8 plasticized dielectric material whereby molecules of the  
9 dielectric material are properly oriented; and

10 (d) curing and forming the dielectric plate in which holes  
11 corresponding to the core pins are formed.

1 2. The method as claimed in Claim 1, wherein the core pins have a rhombic  
2 cross section which form rhombic holes in the plate.

1 3. The method as claimed in Claim 1, wherein at least some of the core pins  
2 are alternately arranged in rows whereby the holes formed in the plate are  
3 also alternately arranged in rows.

1 4. The method as claimed in Claim 1, wherein the dielectric material is a  
2 liquid crystal polymer.

1 5. The method as claimed in Claim 1, wherein the plate is rectangular, and  
2 wherein the thermal expansion coefficient of the plate in a longitudinal  
3 direction is  $13 \times 10^{-6}$  mm/mm $^{\circ}$ C and the thermal expansion coefficient of  
4 the plate in a lateral direction is  $22 \times 10^{-6}$  mm/mm $^{\circ}$ C.

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1 6. The method as claimed in Claim 5, wherein the plate is a base plate of a  
2 ball grid array type connector mounted on a circuit board, and wherein  
3 the circuit board has a coefficient of thermal expansion of  $17-20 \times 10^{-6}$   
4 mm/mm $^{\circ}$ C substantially corresponding to the longitudinal and lateral  
5 direction thermal expansion coefficients of the plate.

1 7. The method as claimed in Claim 1, wherein the plate is a base plate of a  
2 ball grid array type connector mounted to a circuit board made of a  
3 material having a thermal expansion coefficient substantially  
4 corresponding to the thermal expansion coefficient of the plate.

1 8. The method as claimed in Claim 1, wherein at least some of the holes are  
2 blind holes.

1 9. The method as claimed in Claim 1, wherein the holes formed in the plate  
2 have different sizes.

1 10. The method as claimed in Claim 1, wherein the core pins have an  
2 elliptical cross section forming elliptical holes in the plate.

1 11. The method as claimed in Claim 1, wherein the core pins are arranged to  
2 guide the flow of the dielectric material to completely and uniformly fill  
3 in the mold.

1 12. An electrical connector comprising a base plate fixed to a circuit board  
2 and a cover movably mounted to the base plate, the base plate defining  
3 contact receiving bores for receiving and retaining conductive contacts  
4 therein, the contacts being soldered to corresponding conductive pads  
5 formed on the circuit board by means of a ball grid array technique, the

6 cover being adapted to retain an electronic device thereon, pins of the  
7 electronic device extending through holes defined in the cover and  
8 partially extending into the contact receiving holes whereby when the  
9 cover is moved with respect to the base, the pins are brought into contact  
10 and thus electrically engage with the contacts, wherein the base plate is  
11 made of a dielectric material by means of injection molding with a mold  
12 comprising core pins whereby the base plate molded thereby defines a  
13 plurality of holes in a predetermined pattern for reducing a difference  
14 between thermal expansion coefficients of the base plate in first and  
15 second directions substantially normal to each other.

1 13. The electrical connector as claimed in Claim 12, wherein the holes are  
2 rhombic with a major diagonal direction thereof being substantially  
3 parallel to a flowing direction of a plasticized fluid of the dielectric  
4 material.

1 14. The electrical connector as claimed in Claim 12, wherein at least some of  
2 the holes formed in the plate are alternately arranged in rows.

1 4 15. The electrical connector as claimed in Claim 12, wherein the dielectric  
2 material is a liquid <sup>crystalline</sup> ~~crystal~~ polymer.

1 5 16. The electrical connector as claimed in Claim 12, wherein the base plate is  
2 substantially rectangular, and wherein the thermal expansion coefficient  
3 of the plate in the first direction is <sup>substantially close to</sup>  $13 \times 10^{-6}$  mm/mm $\cdot^{\circ}$ C and the thermal  
4 expansion coefficient of the plate in the second direction is <sup>substantially close to</sup>  $22 \times 10^{-6}$   
5 mm/mm $\cdot^{\circ}$ C.

1 <sup>6</sup>/<sub>11</sub> The electrical connector as claimed in Claim <sup>1</sup>/<sub>12</sub>, wherein the circuit  
2 board is made of a material having a thermal expansion coefficient  
3 substantially corresponding to the thermal expansion coefficient of the  
4 base plate.

1 <sup>7</sup>/<sub>18</sub> The electrical connector as claimed in Claim <sup>1</sup>/<sub>12</sub>, wherein the holes  
2 formed in the base plate have different sizes.

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1 19. The electrical connector as claimed in Claim 12, wherein the holes  
2 defined in the base plate are elliptical with a major direction thereof  
3 being substantially parallel to a flowing direction of a plasticized fluid of  
4 the dielectric material.

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1 20. An electrical assembly comprising a connector and a circuit board, said  
2 connector including at least a base plate retaining a plurality of  
3 conductive contacts thereto, each of said contacts being attached to the  
4 circuit board via a solder ball positioned at a tip of a tail portion of the  
5 contact, said base plate defining a plurality of holes around the contacts  
6 wherein said holes are designedly arranged to be properly located,  
7 dimensioned and shaped so that a thermal expansion coefficient of said  
8 base plate is modified to be substantially close to that of the circuit board  
9 for preventing breakage of said solder balls.

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